

AMENDMENTS TO THE CLAIMS

Please **AMEND** claims 1, 17, and 20 as shown below.

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently Amended) A control system for supplying a fuel to a fuel cell stack that includes an anode and a cathode and generates electrical energy by a chemical reaction of the fuel, comprising:

a fuel storage unit that stores the fuel to be supplied to the fuel cell stack;

a diluent storage unit that stores only a diluent that is a byproduct of the chemical reaction in the fuel cell stack;

a sensor that detects a concentration of a fuel in a fuel mixture solution and outputs a signal according to the concentration; and

a control unit that receives the signal from the sensor and controls the fuel mixture solution,

wherein the diluent is H₂O.

2. (Previously Presented) The control system of claim 1, wherein the sensor has a portion that varies volume thereof depending on the concentration of the fuel.

3. (Original) The control system of claim 1, further comprising:

a fuel mixing unit that mixes the fuel supplied from the fuel storage unit and the diluent supplied from the diluent storage unit.

4. (Original) The control system of claim 3, wherein the sensor is located in the fuel mixing unit.

5. (Original) The control system of claim 4, wherein the sensor detects the fuel concentration using characteristics that volumes of the sensor change depending on the fuel concentration.

6. (Original) The control system of claim 1, further comprising:
a line between the fuel storage unit and the diluent storage unit,
wherein the line supplies the fuel mixture.

7. (Original) The control system of claim 6, wherein the sensor is located in the line.

8. (Original) The control system of claim 7, wherein the sensor detects the fuel concentration using characteristics that volumes of the sensor change depending on the fuel concentration.

9. (Original) The control system of claim 1, wherein the sensor comprises:
a substrate; and
a sensor film attached to a surface of the substrate,
wherein the sensor film changes volume thereof depending on the concentration of the fuel in the fuel mixture solution.

10. (Original) The control system of claim 1, wherein the sensor comprises:

an external electrode;

an internal electrode; and

a sensor member that fills the space between the internal electrode and the external electrode, wherein the sensor member changes volume thereof depending on the concentration of the fuel mixture solution.

11. (Original) The control system of claim 9, wherein the sensor is manufactured using polymeric ion exchange membrane or resin.

12. (Original) The control system of claim 10, wherein the sensor is manufactured using polymeric ion exchange membrane or resin.

13. (Original) The control system of claim 9, wherein the sensor comprises an electronic circuit that outputs an electrical signal depending on a change in the volume of the sensor.

14. (Previously Presented) The control system of claim 10, wherein the sensor comprises an electronic circuit that outputs an electrical signal depending on a change in the volume of the sensor.

15. (Previously Presented) The control system of claim 11, wherein the polymeric ion exchange membrane or resin is one of polystyrene sulfonic acid, poly ether ether sulfone sulfonic acid, perfluorinated sulfonic acid polymer, polyimide sulfonic acid, sulfonated polyolefin and sulfonated polysulfane.

16. (Previously Presented) The control system of claim 12, wherein the polymeric ion exchange membrane or resin is one of polystyrene sulfonic acid, poly ether ether sulfone sulfonic acid, perfluorinated sulfonic acid polymer, polyimide sulfonic acid, sulfonated polyolefin and sulfonated polysulfane.

17. (Currently Amended) A sensor for a fuel concentration in a fuel cell, comprising:
a substrate; and
a sensor film on the substrate,
wherein the sensor film changes volume thereof depending on a concentration of fuel in fuel mixture, and
wherein a signal is output when an expansion coefficient of the sensor is not
within a reference range.

18. (Original) The sensor of claim 17, wherein the sensor film is made of polymeric ion exchange membrane or resin.

19. (Original) The sensor of claim 17, wherein the polymeric ion exchange membrane or resin is one of polystyrene sulfonic acid, poly ether ether sulfone sulfonic acid, sulfonated polyolefin and sulfonated polysulfane.

20. (Currently Amended) A sensor for a fuel concentration in a fuel cell comprising:
an external electrode;
an internal electrode; and
a sensor member that fills the space between the internal electrode and the external electrode,

wherein the sensor member changes volume thereof depending on a concentration of fuel in fuel mixture, and

wherein a signal is output when an expansion coefficient of the sensor is not within a reference range.